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Rolling Knolls Landfill Settling Parties

Addendum 1 to the Quality Assurance Project Plan for the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill Superfund Site

Chatham, New Jersey

~~April~~ August 2015

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Rolling Knolls Landfill Superfund Site
Chatham, New Jersey

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Rolling Knolls Landfill Settling Parties

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2015 Quality Assurance Project Plan Addendum 1 ~~Worksheets~~

This document serves as an Addendum to the Data Gaps Quality Assurance Project Plan (QAPP) for the Rolling Knolls Landfill Superfund Site (the site) located in Chatham, New Jersey (October 2014). This QAPP Addendum relates to the additional soil and sediment sampling required to complete the objectives originally identified in Section 1.1 of the Approved Data Gap Sampling and Analysis Plan (SAP) (November 2014) and to address additional delineation concerns identified by the U.S. Environmental Protection Agency (USEPA) and New Jersey Department of Environmental Protection (NJDEP) (letters dated June 17, 2015 and August 17, 2015) to further delineate the nature and extent of contamination at the site.

In addition, the Group is proposing additional sampling to that requested by USEPA and NJDEP. The purpose of these samples is to further delineate constituents of concern at the site. This addendum contains the sampling proposed by the USEPA, NJDEP, and the Group.

Information that was included in the approved December 2014 QAPP for the project should be followed, with the following additions to the worksheets specific to the additional delineation samples. The following worksheets have been revised:

Worksheet #14/16: Project Tasks & Schedule

Worksheet #17: Sampling Design and Rationale

Worksheet #18: Sampling Locations and Methods

Worksheet #20: Field QC Summary

QAPP Worksheet #14/16: Project Tasks & Schedule

Activity	Responsible party	Planned start date	Planned completion date	Deliverable(s)	Deliverable due date
Mobilization	ARCADIS	21 September 2015	21 September 2015	Field notes	21 September 2015
Underground utility clearing	ARCADIS	21 September 2015	21 September 2015	Field notes of New Jersey One-Call utility mark outs	21 September 2015
Sample collection – soil and sediment	ARCADIS	21 September 2015	16 October 2015	Field notes, map of boring locations, and soil logs	23 October 2015
Analysis of soil and sediment samples	TestAmerica	22 September 2015	16 November 2015	Report of Analyses/Data package	16 November 2015
Validation of soil and sediment data	ARCADIS	19 October 2015	11 December 2015	Validation summary report	18 December 2015
Third groundwater sampling event (all new wells)	ARCADIS	19 October 2015	28 October 2015	Field notes and purge logs	4 November 2015
Groundwater sample analysis	TestAmerica	20 October 2015	30 November 2015	Laboratory data packages	30 November 2015
Validation of third groundwater sampling event data	ARCADIS	17 November 2015	30 December 2015	Validation summary report	30 December 2015
Usability assessment	Project Team	December 2015	January 2016	Meeting minutes/Usability assessment summary report	January 2016
Final report	ARCADIS	31 December 2015	5 February 2016	Final report	5 February 2016

Note: The tasks included in this worksheet represent the remaining activities for the Data Gaps SAP implementation. The text section of the approved QAPP Worksheet #14 & 16 are not changed in the context of this Addendum, hence it is not repeated here.

QAPP Worksheet #17: Sampling Design and Rationale

Physical boundaries for the area under study

- Figure 1 depicts the estimated boundaries of the landfill and surface debris area based on observations during test pit activities. Eastern and southern portions of the landfill are located within the Great Swamp National Wildlife Refuge (GSNWR).

Time period being represented by the collected data

- The additional delineation soil and sediment sampling is scheduled for September and October 2015. All data will represent current conditions.

Description of the sampling area

- The sampling areas were selected to address additional delineation concerns identified by USEPA, NJDEP, and the Group following collection of the soil and sediment samples during the initial Data Gaps SAP implementation (November 2014 through March 2015).

- The sampling areas include soil along the perimeter of the estimated landfill boundary (SS-165 through SS-176), soil located in the interior of the landfill (SS-177 through SS-183), sediment along the perimeter of the estimated landfill boundary (SD-45 through SD-50 and SD-52 through SD-68), and sediment in ponds near the landfill (SD-51 and SD-69).

Sample locations

- **Soil samples.** The proposed soil sampling locations are shown on Figures 2a and 2b.

    a. Basis for the number and placement of samples: A total of 34 soil samples, with 4 additional samples (contingent on the results), will be collected. Soil sampling locations located off the boundary of the landfill in native soil (SS-165 through SS-176) are near where previous soil samples contained concentrations of one or more constituents of concern (COCs) exceeding its New Jersey Soil Remediation Standard (SRS) or in areas identified as potential depositional zones. Soil sampling locations located within the interior of the landfill (SS-177 through SS-183) were selected to define the vertical delineation within the landfill. The soil samples collected from locations SS-165 through SS-176 will be analyzed for semivolatile organic compounds (SVOCs) (including SVOCs by selective ion monitoring [SIM]), polychlorinated biphenyls (PCBs) as Aroclors, pesticides, target analyte list (TAL) metals, and cyanide. In addition, the sample collected from location SS-168 will also be analyzed for PCB congeners. The soil samples collected from locations SS-177 through SS-183 will be analyzed for full target compound list (TCL)/TAL (i.e., volatile organic compounds [VOCs], SVOCs, PCBs as Aroclors, pesticides, metals, and cyanide) and SVOCs by SIM.

b. How sample positions will be located: Sample locations were selected in consultation with USEPA and NJDEP. They will be located using site landmarks (e.g, monitoring wells or other permanent features) and global positioning system (GPS). All proposed soil sampling locations will be surveyed to satisfy NJDEP requirements.

c. If a soil sample cannot be collected where planned, the sample location may be moved to another location within 10 feet of the proposed location. If a suitable location is not available within 10 feet of the proposed location, a field change request will be submitted to USEPA for approval prior to relocating the sample.

- **Sediment samples.** The proposed sediment sampling locations are shown on Figures 2a and 2b.

a. Basis for the number and placement of samples: A total of 24 sediment samples, with 1 additional sample (contingent on the results), will be collected. Sediment samples will be collected from surface water bodies near the landfill that were not sampled during the previous investigations, and along the perimeter of the estimated landfill boundary. The sediment samples collected from locations SD-45 through SS-60 and SD-63 through SD-69 will be analyzed for SVOCs (including SVOCs by SIM), PCBs as Aroclors, pesticides, TAL metals, cyanide, pH, total organic carbon (TOC), and grain size. The sediment samples collected from locations SD-61 and SD-62 will be analyzed for full TCL/TAL (i.e., VOCs, SVOCs, PCBs as Aroclors, pesticides, metals, and cyanide), SVOCs by SIM, pH, TOC, and grain size.

b. How sample positions will be located: Sample locations were selected in consultation with USEPA and NJDEP. They will be located using site landmarks (e.g, monitoring wells or other permanent features) and GPS. All proposed sediment sampling locations will be surveyed to satisfy NJDEP requirements.

c. If a sediment sample cannot be collected where planned, the sample location may be moved to another location within 10 feet of the proposed location. If a suitable location is not available within 10 feet of the proposed location, a field change request will be submitted to USEPA for approval prior to relocating the sample.

QAPP Worksheet #18: Sampling Locations and Methods

Sample ID	Matrix	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
SS-165 SS-166 SS-167 SS-169 SS-170 SS-171 SS-172 SS-175 SS-176	Soil	0.0-1.0 and 1.0-2.0	Macrocore ~~or grab sample~~	SVOCs, SVOCs-SIM, PCBs (as Aroclors), ~~lead, vanadium~~Pesticides, TAL Metals, Cyanide	SOP 5, 17	
~~SS-166~~	~~Soil~~	~~0.0-1.0~~	~~Macrocore or grab sample~~	~~PCBs (as Aroclors), lead, vanadium~~	~~SOP 5~~	
~~SS-167~~	~~Soil~~	~~0.0-1.0~~	~~Macrocore or grab sample~~	~~PCBs (as Aroclors), lead, vanadium~~	~~SOP 5~~	
SS-168	Soil	0.0-1.0 and 1.0-2.0	Macrocore ~~or grab sample~~	SVOCs, SVOCs-SIM, PCBs (as Aroclors), PCB congeners, Pesticides, TAL Metals, Cyanide~~copper, lead~~	SOP 5, 17	
~~SS-169~~	~~Soil~~	~~0.0-1.0~~	~~Macrocore or grab sample~~	~~lead~~	~~SOP 5~~	
~~SS-170~~	~~Soil~~	~~0.0-1.0~~	~~Macrocore or grab sample~~	~~lead~~	~~SOP 5~~	

Sample ID	Matrix	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
~~SS-171~~	~~Soil~~	~~0.0-1.0~~	~~Macrocore or grab sample~~	~~lead~~	~~SOP 5~~	
~~SS-172~~	~~Soil~~	~~0.0-1.0~~	~~Macrocore or grab sample~~	~~lead~~	~~SOP 5~~	
SS-173 SS-174	Soil	0.0-1.0 and 1.0-2.0	Macrocore ~~or grab sample~~	SVOCs, SVOCs-SIM, PCBs (as Aroclors), ~~arsenic, cadmium, copper, cyanide, lead, mercury~~ Pesticides, TAL Metals, Cyanide	SOP 5, 17	Contingent Sample
~~SS-174~~	~~Soil~~	~~0.0-1.0~~	~~Macrocore or grab sample~~	~~PCBs (as Aroclors), arsenic, cadmium, copper, cyanide, lead, mercury~~	~~SOP 5~~	~~Contingent Sample~~
SS-177 SS-178 SS-179 SS-180 SS-181 SS-182 SS-183	Soil	TBD Note: Two samples will be collected from each location.	Macrocore	VOCs, SVOCs, SVOCs-SIM, Pesticides, PCBs (as Aroclors), TAL Metals, Cyanide	SOP 5, 17	
SD-45 SD-46 SD-47	Sediment	0.0-1.0	Grab sample	SVOCs, SVOCs-SIM, PCBs (as Aroclors), Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size	SOP 14	

Sample ID	Matrix	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
SD-48 SD-49 SD-51 SD-52 SD-53 SD-54 SD-55 SD-56 SD-57 SD-58 SD-59 SD-60 SD-63 SD-64 SD-65 SD-66 SD-67 SD-68 SD-69						
~~SD-46~~	~~Sediment~~	~~0.0-1.0~~	~~Grab sample~~	~~PCBs (as Aroclors), arsenic, cadmium, copper, cyanide, lead, mercury~~	~~SOP 14~~	
~~SD-47~~	~~Sediment~~	~~0.0-1.0~~	~~Grab sample~~	~~PCBs (as Aroclors),~~	~~SOP 14~~	

Sample ID	Matrix	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
				~~arsenic, cadmium, copper, cyanide, lead, mercury~~		
~~SD-48~~	~~Sediment~~	~~0.0-1.0~~	~~Grab sample~~	~~PCBs (as Aroclors), arsenic, cadmium, copper, cyanide, lead, mercury~~	~~SOP 14~~	
~~SD-49~~	~~Sediment~~	~~0.0-1.0~~	~~Grab sample~~	~~PCBs (as Aroclors), arsenic, cadmium, copper, cyanide, lead, mercury~~	~~SOP 14~~	
SD-50	Sediment	0.0-1.0	~~Macrocore or~~ ~~g~~Grab sample	SVOCs, SVOCs-SIM, PCBs (as Aroclors), Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size ~~arsenic, cadmium, copper, cyanide, lead, mercury~~	SOP 14	Contingent Sample
SD-61 SD-62	Sediment	0.0-1.0	Grab sample	VOCs, SVOCs, SVOCs-SIM, PCBs (as Aroclors), Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size	SOP 14	

Abbreviations:
ft bgs – feet below ground surface
PCBs – ~~P~~polychlorinated biphenyls
SOP – ~~S~~standard ~~O~~operating ~~P~~procedure
SVOC – semivolatile organic compounds
SVOC-SIM – semivolatile organic compounds by selective ion monitoring
TAL – target analyte list

TBD – to be determined; sample depth is contingent on the depth of landfilled material observed in the boring and the depth of the clay layer. One sample will be collected immediately beneath the landfilled material and one sample will be collected immediately above the clay.
TOC – total organic carbon
VOC – volatile organic compounds

~~Standard operating procedures~~SOPs are available in the QAPP (ARCADIS; December 2014).

QAPP Worksheet #20: Field QC Summary

Matrix	Analyte/Analytical Group	Test Method / SOP	Field Samples	Field Duplicates	Matrix Spikes	Matrix Spike Duplicates	Equipment Blanks	Trip Blanks	Total # analyses
Soil	VOCs	SOM01.2/TAB-4	14	1	1	1	1	1	19
Soil	SVOCs	SOM01.2/TAB-3	38	2	1	1	2	0	44
Soil	SVOCs-SIM	SOM01.2-SIM/TAB-3	38	2	1	1	2	0	44
Soil	PCBs (as Aroclors)	SOM01.2/TAB-1	~~10~~38	~~1~~2	1	1	~~1~~2	0	~~14~~44
Soil	Pesticides	SOM01.2/TAB-2	38	2	1	1	2	0	44
Soil	TAL Metals, Mercury, Cyanide	ISM01.3/TAB-5, TAB-6, TAB-7	~~10~~38	~~1~~2	1	1	~~1~~2	0	~~14~~44
Soil	PCB Congeners	EPA 1668/ TAWS-1	~~1~~2	0	0	0	1	0	~~2~~3
Sediment	VOCs	SOM01.2/TAB-4, TAB-11	2	1	1	1	1	1	7
Sediment	SVOCs	SOM01.2/TAB-3	25	2	1	1	1	0	30
Sediment	SVOCs SIM	SOM01.2-SIM/TAB-3	25	2	1	1	1	0	30
Sediment	PCBs (as Aroclors)	SOM01.2/TAB-1	~~6~~25	~~0~~2	~~0~~1	~~0~~1	1	0	~~7~~30
Sediment	Pesticides	SOM01.2/TAB-2	25	2	1	1	1	0	30
Sediment	TAL Metals, Mercury and Cyanide	ISM01.3/TAB-5, TAB-6, TAB-7	~~5~~25	~~0~~2	~~0~~1	~~0~~1	1	0	~~6~~30

Matrix	Analyte/Analytical Group	Test Method / SOP	Field Samples	Field Duplicates	Matrix Spikes	Matrix Spike Duplicates	Equipment Blanks	Trip Blanks	Total # analyses
Sediment	pH, TOC, grain size	Lloyd Kahn/TAB-9	~~6~~25	~~0~~2	~~0~~1	~~0~~1	0	0	~~6~~29

Abbreviations:
PCBs – ~~P~~polychlorinated ~~B~~biphenyls
SOP – ~~S~~standard ~~O~~operating ~~P~~procedure
SVOC – semivolatile organic compounds
SVOC-SIM – semivolatile organic compounds by selective ion monitoring
TAL – ~~T~~target ~~A~~analyte ~~L~~list
TOC – ~~T~~total ~~O~~organic ~~C~~carbon
VOC – volatile organic compounds